

Laser Welding in Electronic Packaging

The laser has proven its worth in numerous high reliability electronic packaging applications ranging from medical to missile electronics. In particular, the pulsed YAG laser is an extremely flexible and versatile tool capable of hermetically sealing microelectronics packages containing sensitive components without damaging them. This paper presents an overview of details that must be considered for successful use of laser welding when addressing electronic package sealing. These include; metallurgical considerations such as alloy and plating selection, weld joint configuration, design of optics, use of protective gases and control of thermal distortions.

The primary limitations on use of laser welding electronic for packaging applications are economic ones. The laser itself is a relatively costly device when compared to competing welding equipment. Further, the cost of consumables and repairs can be significant. These facts have relegated laser welding to use only where it presents a distinct quality or reliability advantages over other techniques of electronic package sealing.

Because of the unique noncontact and low heat inputs characteristics of laser welding, it is an ideal candidate for sealing electronic packages containing MEMS devices (microelectromechanical systems). This paper addresses how the unique advantages of the pulsed YAG laser can be used to simplify MEMS packaging and deliver a product of improved quality.